

***Not Recommended for New Installations.***

Please contact Technical Support for more information.

## ***High Speed Asynchronous to Synchronous Converter***

**Model 2011**

**Documentation Number 2011AS3297**

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# 1.0 WARRANTY INFORMATION

B&B Electronics warrants all Model 2011 components to be free from defects, and will, at our option, repair or replace the product should it fail within one year from the first date of shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall B&B Electronics be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. B&B Electronics specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

## 1.1 RADIO AND TV INTERFERENCE

The Model 2011 generates and uses radio frequency energy, and if not installed and used properly--that is, in strict accordance with the manufacturer's instructions--may cause interference to radio and television reception. The Model 2011 is designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 2011 does cause interference to radio or television reception, which can be determined by disconnecting the RS-232 interface, the user is encouraged to try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, reorienting the receiving antenna and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

## 1.2 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to B&B Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from B&B Electronics Customer Service at (815) 433-5100. *Packages received without an RMA number will not be accepted.*

B&B Electronics' technical staff is also available to answer any questions that might arise concerning the installation or use of your Model 2011. Technical Service hours: 8AM to 5PM CST, Monday through Friday.

## 2.0 GENERAL INFORMATION

Thank you for your purchase of this B&B Electronics product. This product has been thoroughly inspected and tested and is warranted for one year parts and labor. If any questions or problems arise during installation or use of this product, please do not hesitate to contact B&B Electronics Technical Support at (815) 433-5100.

### 2.1 FEATURES

- Conforms to CCITT V.22 and V.14 Standards
- Lets asynchronous terminals communicate with synchronous modems and multiplexers
- Accepts character lengths to 11 bits
- Requires no AC power or batteries
- Supports data rates to 64 Kbps
- Automatically adjusts synchronous data rates
- Miniature size
- Plugs directly into async. or sync. DB-25 port
- Accepts external clocking
- Made in the USA

### 2.2 DESCRIPTION

The B&B Model 2011 asynchronous to synchronous converter plugs directly into a local asynchronous DTE (terminal, PC, etc.) and connects that DTE, via RS-232 cable, to a synchronous DCE. When the same set-up is installed on the remote end, the local and remote DTEs can communicate over the synchronous link.

Drawing power from either the synchronous or asynchronous RS-232 interface, the Model 2011 needs no AC power or batteries to operate and supports RS-232 data rates from 64 Kbps. Because the Model 2011 automatically adjusts the synchronous data rate to match the asynchronous DTE's output rate, no data rate strapping is necessary. The Model 2011 derives clocking externally from the clock of the synchronous DCE, and imposes no limit on data block size. Characters may be up to 11 bits long.

Measuring only 3.2" x 2.0" x .75", the Model 2011 is housed in a sturdy ABS plastic case. It comes fully equipped with a DB-25 male connector and a DB-25 female connector, which plug directly into the synchronous and asynchronous ports.

## 3.0 CONFIGURATION

The Model 2011 is configured using internal DIP switches. Figure 1 shows the location of the Model 2011's configuration switches.

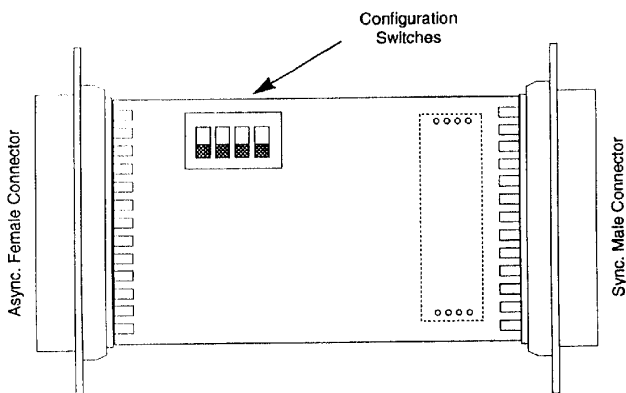


Figure 1. Switch locations on the Model 2011 PC board

### 3.1 ACCESSING INTERNAL SWITCHES

The Model 2011's DIP switches are mounted on the PC board. To access the PC board, insert the blade of a small flathead screwdriver into the slot on one side of the Model 2011's case, then pop the case open by twisting the blade. Repeat on the other side of the case. You should now be able to pull the case halves apart and access the DIP switches on the PC board. Once you have set the switches properly, align the case halves and snap them together.

### 3.2 SETTING INTERNAL SWITCHES

Three DIP switches are used to configure the Model 2011: two switches set the character length and one switch matches the signaling rates of the asynchronous and synchronous ports. Figure 2 shows the orientation of the DIP switches.

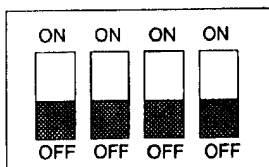


Figure 2. DIP switch orientation

### 3.2.1 CHARACTER LENGTH

Switches SW1-1 and SW1-2 operate jointly to set the asynchronous character length. The asynchronous character length setting is determined by combining the number of start, stop, data and parity bits that make up each character generated by the asynchronous DTE. The Model 2011 does not care about the composition of each asynchronous character, only its length is significant. Below are the combined switch settings that set the four possible asynchronous character lengths:

	<u>SW 1-1</u>	<u>SW 1-2</u>
8 bit	OFF	ON
9 bit	ON	ON
10 bit	OFF*	OFF*
11 bit	ON	OFF

\* Default settings

### 3.2.2 EXTENDED SIGNALING RATE (ESR)

The position of switch SW1-3 ensures that the asynchronous input data rate matches the synchronous output data rate. When switch SW1-3 is set to OFF, the asynchronous bit rate must match the synchronous clock rate to a tolerance of -2.5% to +1%. When switch SW1-3 is set to ON, the asynchronous bit rate must match the synchronous clock rate to a tolerance of -2.5% to +2.3%.

	<u>SW 1-3</u>
-2.5% to +1%	OFF*
-2.5% to +2.3%	ON

\*Default settings

**NOTE: Switch SW1-4 is not used.**

## 4.0 INSTALLATION

The Model 2011 is designed to be used *in pairs*, with one unit installed between an asynchronous DTE and a synchronous DCE on either end of a synchronous communication link. Figure 3 illustrates a typical Model 2011 installation.

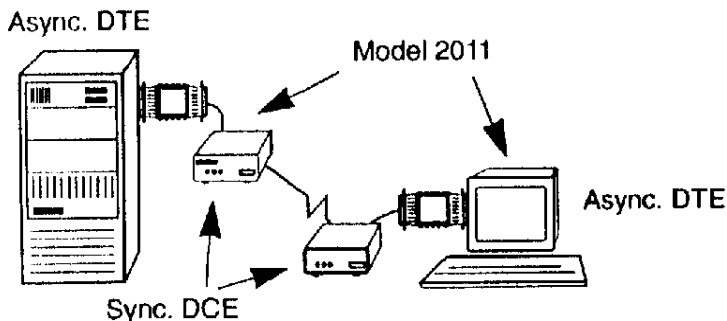


Figure 3. Typical Model 2011 application

### 4.1 CONNECTING THE ASYNCHRONOUS PORT

The asynchronous port of the Model 2011 is a DB-25 female and is configured as "DCE". Therefore it wants to talk to a DTE device such as a terminal or PC. The Model 2011 may be plugged directly into the DB-25 serial port of a DTE or connected via "straight through" cable.

### 4.2 CONNECTING THE SYNCHRONOUS PORT

The synchronous port of the Model 2011 is a DB-25 male and is configured as "DTE". Therefore it wants to talk to a DCE device such as a modem or multiplexer. The Model 2011 may be plugged directly into the DB-25 serial port of a DCE or connected via "straight through" cable.

# APPENDIX A: SPECIFICATIONS

**Data Rates:** Up to 64 Kbps

**Clocking:** Provided by modem or multiplexer

**Buffer:** 4 bit RTS override feature empties buffers before dropping RTS

**Data Transmission:** Full or half duplex

**Connectors:** DB-25 female on asynchronous port, DB-25 male on synchronous port

**Power Supply:** None required; uses power from data and control signals

**Temperature Range:** 0-60°C (32-140°F)

**Altitude:** 0-15,000 feet

**Humidity:** Up to 95% non-condensing

**Dimensions:** 3.2" x 2.0" x 0.75"

**Weight:** 2 oz.



## APPENDIX B: ASYNCHRONOUS PORT CONNECTIONS (CONFIGURED AS “DCE”)

<u>Pin</u>	<u>Name</u>	<u>Description</u>
1	FG	Frame Ground; connected straight to synchronous port
2	TXD	Transmit Data (to 2011); data input from asynchronous port; Input to the 2011 power supply
3	RXD	Receive Data (from 2011); data output to asynchronous port
4	RTS	Request to Send (to 2011); input to the power supply
5	CTS	Clear to Send (from 2011); connected straight through to synchronous port
6	DSR	Data Set Ready (from 2011); connected straight through to synchronous port
7	SG	Signal Ground; connected straight through to synchronous port
8	CD	Carrier Detect (from 2011); connected straight through to synchronous port
9	+DCV	Connected straight through to synchronous port
10	-DCV	Connected straight through to synchronous port
20	DTR	Data Terminal Ready (to 2011); input to power supply
22	RI	Ring Indicator (from 2011); connected straight through to synchronous port

## APPENDIX C: SYNCHRONOUS PORT CONNECTIONS (CONFIGURED AS “DTE”)

<u>Pin</u>	<u>Name</u>	<u>Description</u>
1	FG	Frame Ground; connected straight to asynchronous port
2	TXD	Transmit Data (from 2011); data output to synchronous port
3	RXD	Receive Data (to 2011); data input from the synchronous port input to 2011 power supply
4	RTS	Request to Send (from 2011); 4 bit delay from asynchronous port (2011 waits 4 bits before dropping RTS to the synchronous port; this facilitates use in a polling environment)
5	CTS	Clear to Send (to 2011); connected straight through to asynchronous port
6	DSR	Data Set Ready (to 2011); connected straight through to asynchronous port
7	SG	Signal Ground; connected straight through to asynchronous port
8	CD	Carrier Detect (to 2011); connected straight through to asynchronous port
9	+DCV	Connected straight through to asynchronous port
10	-DCV	Connected straight through to asynchronous port
15	TXC	Transmit clock (to 2011); used to synchronize data conversion from 2011 to synchronous port
17	RXC	Receive clock (to 2011); used to synchronize data conversion from 2011 to synchronous port
20	DTR	Data Terminal Ready (from 2011); input to power supply
22	RI	Ring Indicator (to 2011); connected straight through to asynchronous port

APPENDIX D: BLOCK DIAGRAM

